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PROGRESS REPORT

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Evaluation of Skylab Imagery as an Information Service for Investigating Land Use and Natural Resources (Skylab) NASA Contract: NAS 9-13364.

This report covers the period from July 1 to July 31, 1974.

During this period, Dr. Ernest Hardy, Principal Investigator, Mr. James Skaley, Project Coordinator, and Prof. Elmer Phillips, Photo Consultant, traveled to Houston, Texas to attend the PI Conference. Of particular significance to us were discussions which we had with Mr. Mark Weinstein, Photographic Scientist with Technicolor at JSC. We discussed in detail our processing steps in enlarging duplicate S190A data and procedures used by JSC in processing the original Skylab data. It was concluded that our basic approach was sound, but that we might make some modifications in how we compare the different bands for contrast and density range. Tests are now in progress to make these adjustments. Also discussed were techniques used by Technicolor to correct poor exposure on the S190B color photography. The technique involved making black and white spectral separations by filtering with red, blue and green filters, correcting each band separately for exposure and density, and then recombining the image back to color. It was felt that this would be an ideal technique for enlarging our S190B color photography. We would then be able to treat the red, blue and green separations as separate spectral bands, using the diazo process to make color composites as we now do with the S190A data. Upon return from Houston, this technique was attempted with some S190B color photography over our Long Island test site. Preliminary results appear very good although, because of some limitations of the diazo film, a perfect color rendition was not achieved. It seems probable that a very close approximation is possible with proper masking techniques. These techniques, however, are not necessary

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to properly interpret the S190B data. In effect, the S190B data can now be treated as spectral photography; thereby, we can enhance and suppress detail in the scene as we desire. With the very high resolution of the S190B, we feel that a great deal more information might be devised using this approach.

Considerable progress has also been made on our computerized color prediction model. This model allows us to use the computer to select on the basis of density inputs from points of interest on the different spectral band color composites which provide the maximum color contrast among the densities of interest. As of now the program only selects color contrast between two points by means of calculating the maximum vector distance between possible CIE color coordinates. For each six possibilities, one composite can be generated. The model selects combinations of spectral bands, hue assignment, and exposure level. In this way, we are now able to completely eliminate the trial and error process of constructing color composites. The program is being re-designed to select maximum color contrast on the basis of comparing three points simultaneously. This should allow for a greater versatility in use of the program. The total computer cost to generate six composites is less than \$12.00. This figure may change with further modifications of the program. Enclosed are two composites which were constructed as a result of the information derived from the computer model.

A trip was made to Millbrook, New York, within the Hudson Valley test site, to talk with local county officials and the director of the environmental management council. Survey problems were discussed and applications of satellite and other types of aerial photography were put in perspective in respect to different tasks. Reception was quite favorable. We

encouraged their people to look at different survey problems that they had and to present us with a list from which we could address selected problems. An extensive survey of similar officials will be conducted in the next few months to try to determine better what the user's problems really are and what is indeed feasible to do with satellite photography.

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